Remote Scraper Control
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y:\docs\opstat\scraper.doc

Introduction

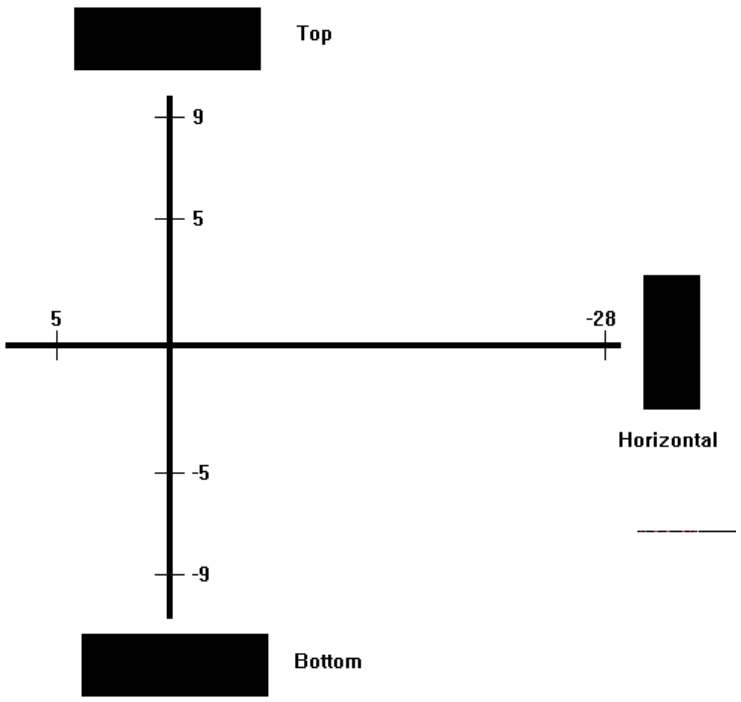
A new ILC (712) has been added to control the scrapers in the sector 11 straight section. Control of the scrapers is now done from the control room with dbchan or the Scraper Application; the PC in the SR11 rack, which previously controlled them, has been disconnected. This document describes the scrapers and how to control them with dbchan and the Scraper Application.

The scrapers

The scrapers are 3 independently controllable blades (2 vertical and 1 horizontal) which can be used to fully, or partially, block the electron beam. In the vertical direction, one blade can be moved into the beam from the bottom of the vacuum chamber and one can be moved into the beam from the top of the chamber. The horizontal blade moves into the beam from the inside of the storage ring.

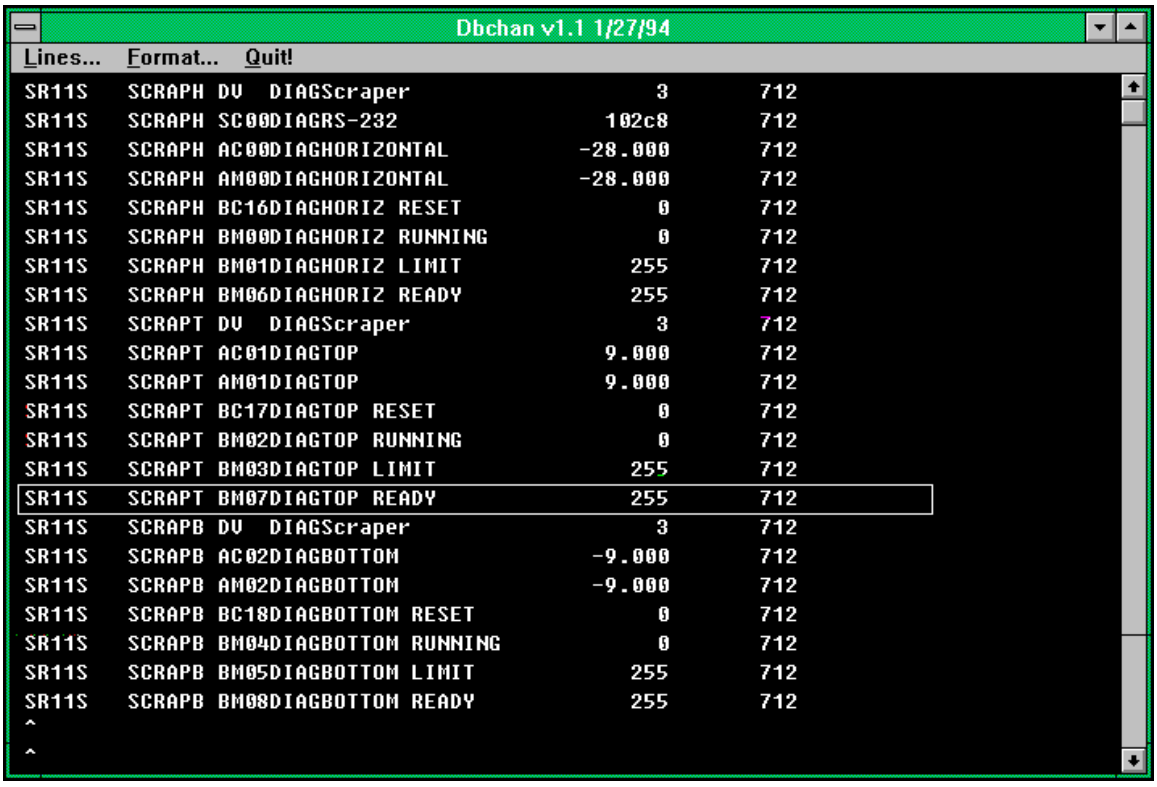
The position of the blades is controlled by 3 stepper motors. Limit switches are used to detect the position of the blades at their fully extracted and inserted positions. The stepper motors and limit switches are controlled and monitored via an indexer that is connected to an ILC (712) by a serial cable. When the ILC is reset, the blades are fully extracted and position is calibrated: for the vertical blades, the fully open position is assumed to be +9mm for the top and -9mm for the bottom; for the horizontal blade the fully extracted position is -28mm (towards the center of the ring).

The coordinate system is shown below (right is towards the center of the ring):



Control with dbchan

Remote control of the scrapers can be done with dbchan. The dbchan page for the scrapers is shown below:



Analog Channels:
Each blade has two analog channels. One is a control and the other a monitor.

SR11S SCRAPH AC00 DIAGHORIZ	- controls the horizontal blade position (-28mm to 5mm)
SR11S SCRAPT AC01 DIAGTOP	- controls the top blade position (-5mm to 9mm)
SR11S SCRAPB AC02 DIAGBOTTOM	- controls the bottom blade position (-9mm to 5mm)

SR11S SCRAPH AM00 DIAGHORIZ	- monitors the horizontal position (-28mm to 5mm)
SR11S SCRAPT AM01 DIAGTOP	- monitors the top blades position (-5mm to 9mm)
SR11S SCRAPB AM02 DIAGBOTTOM	- monitors the bottom blade position (-9mm to 5mm)

Boolean Channels:
Each blade has four boolean channels; three boolean monitors and one boolean control.

SR11S SCRAPH BC16 DIAGHORIZ RESET	- resets the horizontal blade
SR11S SCRAPT BC17 DIAGTOP RESET	- resets the top blade
SR11S SCRAPB BC18 DIAGBOTTOM RESET	- resets the bottom blade

SR11S SCRAPH BM00 DIAGHORIZ RUNNING	- on when horizontal motor is active
SR11S SCRAPT BM02 DIAGTOP RUNNING	- on when top motor is active
SR11S SCRAPB BM04 DIAGBOTTOM RUNNING	- on when bottom motor is active

SR11S SCRAPH BM01 DIAGHORIZ LIMIT	- on when horizontal blade has hit a limit switch
SR11S SCRAPT BM03 DIAGTOP LIMIT	- on when top blade has hit a limit switch
SR11S SCRAPB BM05 DIAGBOTTOM LIMIT	- on when bottom blade has hit a limit switch

SR11S SCRAPH BM06 DIAGHORIZ READY	- on when horizontal blade is ready
SR11S SCRAPT BM07 DIAGTOP READY	- on when top blade is ready
SR11S SCRAPB BM08 DIAGBOTTOM READY	- on when bottom blade is ready

If a scraper blade is reset by activating the reset BC for that particular motor, the ready flags for all the motors will go down until the reset of that particular blade has finished. This means that all motors will ignore their input until the reset is complete. Reseting a scraper moves the blade out until the limit switch is hit. This new position is now considered to be the fully extracted position (-28mm for the horizontal, 9mm for the top and -9mm for the bottom). Reseting a blade takes a few minutes. Also, when the ILC is loaded using `loadilc`, all three blades are reset, thus it takes several minutes for all three ready flags to come up after a loading.

Also, while a blade is in motion (i.e., the run flag is on), the position monitor for that particular blade is invalid. You must wait until the motor has stopped moving for the position monitor to reflect the actual position.

Control with the Scraper Application

The scrapers can also be controlled via the Scraper Application. The main window looks as follows: